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# COMPUTING CURRICULUM PROGRESSION OF KNOWLEDGE , SKILLS AND VOCABULARY

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Our school's Computing scheme aims to instil a sense of enjoyment around using technology and to develop pupil's appreciation of its capabilities and the opportunities technology offers to, create, manage, organise, and collaborate. 'Tinkering' with software and programs forms a part of the ethos of our curriculum as we want to develop pupils' confidence when encountering new technology, which is a vital skill in the ever evolving and changing landscape of technology. Through the curriculum, we intend for pupils not only to be digitally competent and have a range of transferable skills at a suitable level for the future workplace, but also to be responsible online citizens.

We enable pupils to meet the end of Key Stage Attainment targets outlined in the National curriculum and our aims align with those in the National curriculum. Our Computing scheme of work also satisfies all the objectives of the DfE's Education for a Connected World framework. This guidance was created to help equip children for life in the digital world, including developing their understanding of appropriate online behaviour, copyright issues, being discerning consumers of online information and healthy use of technology.

## End of Phase National Curriculum Expectations

| End of EYFS  | End of KS1 Expectations   | End of KS2 Expectations   |
|--|---|---|
| <ul style="list-style-type: none"> <li>➤ Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</li> <li>➤ Explain the reasons for rules, know right from wrong and try to behave accordingly.</li> </ul> | <ul style="list-style-type: none"> <li>➤ understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>➤ create and debug simple programs</li> <li>➤ use logical reasoning to predict the behaviour of simple programs</li> <li>➤ use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>➤ recognise common uses of information technology beyond school</li> <li>➤ use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</li> </ul> | <ul style="list-style-type: none"> <li>➤ design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>➤ use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>➤ use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>➤ understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration</li> <li>➤ use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>➤ select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>➤ use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul> |

## Autumn Term 1

|                         |   | Year 1  | Year 2  | Year 3   | Year 4  | Year 5  | Year 6  |
|-------------------------|---|---|---|--|---|---|---|
| <b>Autumn 1</b>         | <b>Computing systems and networks: using a computer</b>   | <b>Computing systems and networks 1: Using a computer</b>   | <b>Computing systems and networks: What is a computer?</b>  | <b>Computing systems and networks: networks &amp; the internet</b>   | <b>Computing systems and networks: collaborating</b>  | <b>Computing systems and networks: search engines</b>   | <b>Computing systems and networks: Bletchley Park</b>   |
| <b>Sticky knowledge</b> | <p>To be able to understand what a computer keyboard is and recognise some letters and numbers.</p> <p>To know that a mouse can be used to click, drag and create simple drawings.</p> <p>To know that to use a computer you need to log in to it and then log out at the end of your session.</p>              | <p>To know that "log in and log out" means to begin and end a connection with a computer.</p> <p>To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art</p> <p>To know that passwords are important for security.</p>  | <p>To know the difference between a desktop and laptop computer.</p> <p>To know that people control technology.</p> <p>To know some input devices that give a computer an instruction about what to do (output).</p> <p>To know that computers often work together</p>  | <p>To understand what a network is and how a school network might be organised.</p> <p>To know that a server is central to a network and responds to requests made.</p> <p>To know how the internet uses networks to share files.</p> <p>To know that a router connects us to the internet.</p> <p>To know what a packet is and why it is important for website data transfer.</p>   | <p>To understand that software can be used collaboratively online to work as a team.</p> <p>To know what type of comments and suggestions on a collaborative document can be helpful.</p> <p>To know that you can use images, text, transitions and animation in presentation slides.</p>   | <p>To know how search engines work.</p> <p>To understand that anyone can create a website and therefore we should take steps to check the validity of websites.</p> <p>To know that web crawlers are computer programs that crawl through the internet.</p> <p>To understand what copyright is.</p>   | <p>To understand the importance of having a secure password and what "brute force hacking" is..</p> <p>To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2</p> <p>To know about some of the historical figures that contributed to technological advances in computing.</p> <p>To understand what techniques are required to create a presentation using appropriate software.</p>   |
| <b>Key skill.is</b>     | <ul style="list-style-type: none"> <li>➤ Recognising and identifying familiar letters and numbers on a keyboard.</li> <li>➤ Developing basic mouse skills such as moving and clicking.</li> <li>➤ Using a simple online paint tool to create digital art.</li> <li>➤ Learning to log in and log out.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Learning how to explore and tinker with hardware to find out how it works</li> <li>➤ Learning where keys are located on the keyboard.</li> <li>➤ Using a basic range of tools within graphic editing software.</li> <li>➤ Developing control of the mouse through dragging, clicking and resizing of images to create different effects</li> <li>➤ Developing understanding of different software tools.</li> <li>➤ Recognising devices that are connected to the internet.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Understanding what a computer is and that it's made up of different components.</li> <li>➤ Recognising that buttons cause effects and that technology follows instructions.</li> <li>➤ Learning how we know that technology is doing what we want it to do via its output.</li> <li>➤ Using greater control when taking photos with cameras, tablets or computers.</li> <li>➤ Developing confidence with the keyboard and the basics of touch typing.</li> <li>➤ Developing word processing skills,</li> </ul> | <ul style="list-style-type: none"> <li>➤ Understanding the role of the key components of a network</li> <li>➤ Understanding that websites &amp; videos are files that are shared from one computer to another.</li> <li>➤ Learning about the role of packets.</li> <li>➤ Understanding how networks work and their purpose.</li> <li>➤ Identifying the key components within a network, including whether they are wired or wireless.</li> <li>➤ Recognising links between networks and the internet.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</li> <li>➤ Use online software for documents, presentations, forms and spreadsheets.</li> <li>➤ Using software to work collaboratively with others.</li> <li>➤ Understanding that software can be used collaboratively online to work as a team</li> <li>➤ Recognising what appropriate behaviour is</li> </ul> | <ul style="list-style-type: none"> <li>➤ Developing searching skills to help find relevant information on the internet.</li> <li>➤ Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns</li> <li>➤ Learn about different forms of communication that have developed with the use of technology</li> <li>➤ Recognising that information on the Internet might not be true or correct and learning ways of checking validity.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Learning about the history of computers and how they have evolved over time.</li> <li>➤ Using past experiences to help solve new problems.</li> <li>➤ Writing increasingly complex algorithms for a purpose.</li> <li>➤ Debugging quickly and effectively to make a program more efficient.</li> <li>➤ Remixing existing code to explore a problem</li> <li>➤ Changing a program to personalise it.</li> <li>➤ Evaluating code to understand its purpose.</li> <li>➤ Predicting code and adapting it to a chosen purpose.</li> </ul> |

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|-----------------------|--|--|---|--|--|--|--|
|                       |  |  | <p>including altering text, copying and pasting and using keyboard shortcuts.</p> <ul style="list-style-type: none"> <li>➤ Creating and labelling images.</li> <li>➤ Learning how computers are used in the wider world.</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Learning about the purpose of routers.</li> <li>➤ Learning how data is transferred.</li> </ul>  | when collaborating with others online.   |  | <ul style="list-style-type: none"> <li>➤ Using search and word processing skills to create a presentation.</li> <li>➤ Understanding how search engines work.</li> <li>➤ Understanding the importance of secure passwords and how to create them</li> <li>➤ Using search engines safely and effectively.</li> </ul> |
| <b>Key vocabulary</b> | <p>Computer, Computer tower, Monitor, Keyboard, Mouse, Letters, Numbers, Uppercase, Lowercase, Type, log in, log out Computer safety, Protect, Password, Private, Secure, Security, Lock, personal, Left click, Right-click, Arrow, Cursor, paint, stamp, drag, move, drop</p> | <p>Log in, Login, Log out / off, Mouse, Mouse pointer, Click, Keyboard, Screen, Password, Account, Software, Duplicate, Ctrl, Tools, Right click Menu, Layers, Username, Drag, Drag and drop, Digital photograph, Undo, Cursor</p> | <p>Battery, Buttons Camera, Computer, Desktop Device, Digital Digital recorder Electricity Function, Input Invention, Keyboard, Laptop Monitor, Mouse Output, Paying till, Scanner Screen, System Tablet, Technology Video, Wires</p> | <p>Cables, Component, Connection, Corrupted, Data, Desktop, Device, DSL Fibre, File, Internet. Laptop Network, Network map, Network switch, Packets, Radio waves, Router, Server Submarine cables, Tablet, Text map, The Cloud, Web server, Website, Website trackers, WiFi, Wired, Wireless, Wireless Access Points, World Wide Web</p> | <p>Animations, Average, Bar chart Collaboration, Comment, Contribution, Data, Edited, Email account, Format, Freeze, Multiple choice Numerical data, Pie chart, Presentations, Resolved, Reviewing comments, Share, Slides, Software Spreadsheets. Suggestions, Survey Teamwork, Themes, Transitions</p> | <p>Algorithm, Appropriate, Copyright, Correct, Credit, Data leak, Deceive, Fair, Fake, Inappropriate, Incorrect, Index, Information, Keywords, Network, Privacy, Rank, Real, Search engine, TASK, Web crawler, Website</p> | <p>Acrostic Code, Brute force hacking, Caesar cipher Chip and pin system, Cipher, Code, Combination, Contribute, Convince, Date shift cipher, Discovery, Hero Invention, Nth Letter Cipher, Password, Pig Latin, Pigpen cipher, Present, Scrambled, Secret, Secure Technological advancement Trial and error</p>   |

## Spring 1

|                  | EYFS  | Year 1   | Year 2  | Year 3  | Year 4   | Year 5  | Year 6  |
|------------------|---|--|---|---|--|---|---|
| Spring 1         | Programming 1: All about instructions   | Programming 1: algorithms unplugged  | Programming 1: algorithms and debugging   | Computing systems and networks 3: inside a computer   | Programming: Further coding with Scratch   | Data handling: Mars Rover   | Date handling: Big Data 1   |
| Sticky knowledge | <p>To know that being able to follow and give simple instructions is important in computing</p> <p>To understand that it is important for instructions to be in the right order.</p> <p>To understand why a set of instructions may have gone wrong.</p>  | <p>To understand that an algorithm is when instructions are put in an exact order.</p> <p>To know that input devices get information into a computer and that output devices get information out of a computer.</p> <p>To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing</p> <p>To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'.</p> <p>To know that you can add data to a spreadsheet.</p> | <p>To understand what machine learning is and how it enables computers to make predictions.</p> <p>To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times.</p> <p>To know that abstraction is the removing of unnecessary detail to help solve a problem</p>   | <p>To know the roles that inputs and outputs play on computers.</p> <p>To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.</p> <p>To know what a tablet is and how it is different from a laptop/desktop computer.</p>   | <p>To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch.</p> <p>To know what a conditional statement is in programming.</p> <p>To understand that variables can help you to create a quiz on Scratch.</p>   | <p>To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock.</p> <p>To know what numbers using binary code look like and be able to identify how messages can be sent in this format.</p> <p>To understand that RAM is Random Access Memory and acts as the computer's working memory.</p> <p>To know what simple operations can be used to calculate bit patterns.</p>  | <p>To know that data contained within barcodes and QR codes can be used by computers.</p> <p>To know that infrared waves are a way of transmitting data.</p> <p>To know that Radio Frequency Identification (RFID) is a more private way of transmitting data.</p> <p>To know that data is often encrypted so that even if it is stolen it is not useful to the thief.</p>  |
| Key skills       | <ul style="list-style-type: none"> <li>➤ Using logical reasoning to understand simple instructions and predict the outcome.</li> <li>➤ Following instructions as part of practical activities and games.</li> <li>➤ Learning to give simple instructions.</li> <li>➤ Learning to debug</li> </ul> | <ul style="list-style-type: none"> <li>➤ Recognising that some devices are input devices and others are output devices.</li> <li>➤ Learning that decomposition means breaking a problem down into smaller parts.</li> <li>➤ Using decomposition to solve unplugged challenges.</li> <li>➤ Developing the skills associated with sequencing in unplugged activities</li> <li>➤ Following a basic set of instructions.</li> <li>➤ Assembling instructions into a simple algorithm.</li> </ul>      | <ul style="list-style-type: none"> <li>➤ Recognising that some devices are input devices and others are output devices.</li> <li>➤ Learning that decomposition means breaking a problem down into smaller parts.</li> <li>➤ Using decomposition to solve unplugged challenges.</li> <li>➤ Developing the skills associated with sequencing in unplugged activities.</li> <li>➤ Following a basic set of instructions.</li> <li>➤ Assembling instructions into a simple algorithm</li> </ul> | <ul style="list-style-type: none"> <li>➤ Understanding what the different components of a computer do and how they work together.</li> <li>➤ Drawing comparisons across different types of computers.</li> <li>➤ Using decomposition to explain the parts of a laptop computer.</li> <li>➤ Explaining the purpose of an algorithm.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Using decomposition to solve a problem by finding out what code was used.</li> <li>➤ Using decomposition to understand the purpose of a script of code.</li> <li>➤ Creating algorithms for a specific purpose.</li> <li>➤ Coding a simple game.</li> <li>➤ Incorporating variables to make code more efficient.</li> <li>➤ Remixing existing code.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Learning that external devices can be programmed by a separate computer.</li> <li>➤ Recognising how the size of RAM affects the processing of data.</li> <li>➤ Learning the vocabulary associated with data: data and transmit.</li> <li>➤ Recognising that computers transfer data in binary and understanding simple binary addition.</li> <li>➤ Relating binary signals (Boolean) to the simple character-based language, ASCII.</li> <li>➤ Learning that messages can be sent by binary</li> </ul> | <ul style="list-style-type: none"> <li>➤ Understanding and identifying barcodes, QR codes and RFID.</li> <li>➤ Identifying devices and applications that can scan or read barcodes, QR codes and RFID</li> <li>➤ Understanding how barcodes, QR codes and RFID work. Information technology</li> <li>➤ Gathering and analysing data in real time.</li> <li>➤ Creating formulas and sorting data within spreadsheets.</li> <li>➤ Learning how 'big data' can be used to solve a problem or improve efficiency</li> </ul> |

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|                       | instructions, with the help of an adult, when things go wrong.  | <ul style="list-style-type: none"> <li>➤ Learning to debug instructions when things go wrong.</li> <li>➤ Learning to debug an algorithm in an unplugged scenario.</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Learning to debug instructions when things go wrong.</li> <li>➤ Learning to debug an algorithm in an unplugged scenario</li> </ul> |   |   | <p>code, reading binary up to eight characters and carrying out binary calculations.</p> <ul style="list-style-type: none"> <li>➤ Understanding how data is collected in remote or dangerous places.</li> <li>➤ Understanding how data might be used to tell us about a location.</li> <li>➤ Learn about different forms of communication that have developed with the use of technology</li> </ul> |  |
| <b>Key vocabulary</b> | Instructions, Step over, walk around, Turn, Left, Right, To the side, Straight on, Stand still, Stop, Duck, Under, Bend down, Walk, hop, Tiptoe, Shuffle, Skip, Run, Describe, Adjective, Two-part instructions, Instructions, Timer, algorithm, predict, sequence, order, first, second, third, fourth | Algorithm, Automatic, Bug, Chunks, Clear, Code, Debug, Decompose, Decomposition, Device, Directions, Input, Instructions, Manageable. Motion, Order, Organise, Output, Precise, Programming, Problem, Robot, Sensor, Sequence, Solution, Specific, Steps, Tasks, Virtual assistant | Abstraction, Algorithm Artificial intelligence Bug, Clear, Correct, Data, Debug Decompose, Error Key features, Loop, Predict, Unnecessary                                   | Algorithm Assemble CPU (central processing unit) Data, Decompose Desktop, Disassemble GPU (graphics processing unit) Hard drive HDD (hard disk drive) Infinite loop, Input, Keyboard, Laptop, Memory, Microphone Monitor, Mouse, Output, Photocopier Program, QR Code RAM (random access memory) ROM (read only memory) Storage Tablet device Technology Touchscreen Touchpad | Broadcast block, Code blocks Conditional, Coordinates Decomposition, Features Game, Information Negative numbers Orientation, Parameters, Position, Program, Project, Script Sprite, Stage, Tinker, Variables | 8-bit binary, Addition, ASCII, Binary code, Boolean, Byte, Communicate, Construction, CPU Data transmission Decimal numbers Design, Discovery Distance, Hexadecimal Input, Instructions, Internet, Mars Rover Moon, Numerical data, Output, Planet, Radio signal, RAM, Research Scientist, Sequence Signal, Simulation, Space Subtraction, Technology Transmit                                      | Algorithms, Barcode, Binary Boolean, Brand, Chips, Commuter, Contactless, Data Encrypted, Infrared MagicBand, Privacy, Proximity QR code, QR scanner, Radio waves, RFID, Signal Systems/data analyst. Transmission, Wireless |

## Summer 1

|                      | EYFS   | Year 1  | Year 2   | Year 3  | Year 4  | Year 5   | Year 6  |
|----------------------|--|---|--|---|---|--|---|
| <b>Summer 1</b>      | <b>Data handling: introduction to data</b>   | <b>Creating Media: Digital imagery</b>  | <b>Data handling: International space centre</b>   | <b>Creating Media: Video trailers</b>   | <b>Data handling: Investigating Weather</b>   | <b>Creating Media: Stop Motion animation</b>   | <b>Data Handling: Big Data 2</b>  |
| <b>Key knowledge</b> | <p>To know that sorting objects into various categories can help you locate information.</p> <p>To know that using yes/no questions to find an answer is known as a branching database.</p> <p>To know that a pictogram is a way of showing Key knowledge from the unit information.</p> | <p>To understand that holding the camera still and considering angles and light are important to take good pictures.</p> <p>To know that you can edit, crop and filter photographs.</p> <p>To know how to search safely for images online.</p>  | <p>To understand that you can enter simple data into a spreadsheet.</p> <p>To understand what steps you need to take to create an algorithm</p> <p>To know what data to use to answer certain questions.</p> <p>To know that computers can be used to monitor supplies.</p>  | <p>To know that different types of camera shots can make my photos or videos look more effective.</p> <p>To know that I can edit photos and videos using film editing software.</p> <p>To understand that I can add transitions and text to my video</p>  | <p>To know that computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data').</p> <p>To know that a weather machine is an automated machine that respond to sensor data.</p> <p>To understand that 'green screen technology' is a green background in front of which moving subjects are filmed so a separately filmed background can be added to the final image.</p>   | <p>To know that decomposition of an idea is important when creating stop-motion animations</p> <p>To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph</p> <p>To know that editing is an important feature of making and improving a stop motion animation.</p> | <p>To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'.</p> <p>I know that devices or that are not updated are most vulnerable to hackers.</p> <p>To know the difference between mobile data and WiFi.</p>   |
| <b>Key Skills</b>    | <ul style="list-style-type: none"> <li>➤ Representing data through sorting and categorising objects in unplugged scenarios.</li> <li>➤ Representing data through pictograms.</li> <li>➤ Exploring branch databases through physical games.</li> </ul>                                    | <ul style="list-style-type: none"> <li>➤ Using a basic range of tools within graphic editing software.</li> <li>➤ Taking and editing photographs</li> <li>➤ Developing control of the mouse through dragging, clicking and resizing of images to create different effects.</li> <li>➤ Developing understanding of different software tools.</li> <li>➤ Searching and downloading images from the internet safely.</li> <li>➤ When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable</li> </ul> | <ul style="list-style-type: none"> <li>➤ Developing confidence with the keyboard and the basics of touch typing</li> <li>➤ Creating and labelling images</li> <li>➤ Collecting and inputting data into a spreadsheet.</li> <li>➤ Interpreting data from a spreadsheet.</li> <li>➤ Learning how computers are used in the wider world.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</li> <li>➤ Taking photographs and recording video to tell a story. Information technology</li> <li>➤ Using software to edit and enhance their video adding music, sounds and text on screen with transitions.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Using tablets or digital cameras to film a weather forecast.</li> <li>➤ Understanding that weather stations use sensors to gather and record data which predicts the weather.</li> <li>➤ Using keywords to effectively search for information on the internet.</li> <li>➤ Searching the internet for data.</li> <li>➤ Designing a device which gathers and records sensor data.</li> <li>➤ Recording data in a spreadsheet independently.</li> <li>➤ Sorting data in a spreadsheet to compare using the 'sort by...' option. Understanding that data is used to forecast weather.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Decomposing animations into a series of images.</li> <li>➤ Decomposing a story to be able to plan a program to tell a story.</li> <li>➤ Using video editing software to animate.</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).</li> <li>➤ Understanding that computer networks provide multiple services</li> <li>➤ Using search and word processing skills to create a presentation.</li> <li>➤ Creating formulas and sorting data within spreadsheets.</li> <li>➤ Learning about the Internet of Things and how it has led to 'big data'.</li> <li>➤ Learning how 'big data' can be used to solve a problem or improve efficiency.</li> </ul> |

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|--|---|---|--|---|--|---|--|
| <p style="text-align: center;"><b>Key<br/>vocabulary</b></p> | <p>Sort Categorise<br/>Category Group<br/>Describe Texture<br/>Colour Pattern<br/>Size Weight Height<br/>Length More Less<br/>Count In total<br/>Altogether Share<br/>Divide Equal Bigger<br/>than Smaller than<br/>Thicker than<br/>Thinner than</p> | <p>Pictorial story Image<br/>Sequence Plan Photo<br/>Pictures Screen Camera<br/>Image Digital Tablet<br/>Photo Deleting Device<br/>Storage space Editing<br/>Software Visual effects<br/>Crop Filter Import Online<br/>Keyword<br/>Search engine Image Props<br/>Save as Drag and drop<br/>Internet<br/>Edit Collage Download<br/>Orientation Images Resize<br/>Photograph Edit</p> | <p>Space International Space<br/>Station International Space<br/>Centre survival Digital<br/>content Interactive map<br/>Satellite Space Essential<br/>Leisure Astronaut<br/>Transporting Approximately<br/>Dehydrated Rehydrated<br/>Multiple To monitor Sensor<br/>Thermometer Temperature<br/>Display Data Sensor Monitor<br/>Insulation<br/>Crew Ammonia Urine Clean<br/>water Waste water Air<br/>conditioning Freeze</p> | <p>Application, Camera angle, Clip,<br/>Cross blur<br/>Cross fade, Cross zoom<br/>Desktop, Digital device<br/>Dip to black, Directional wipe,<br/>Edit, Film<br/>Film editing software<br/>Graphics, Import<br/>Key events, Laptop<br/>Music, Photo, Plan<br/>Recording, Sound effects,<br/>Storyboard<br/>Time code, Trailer<br/>Transition, Video<br/>Voiceover</p> | <p>Categorise Category Chart Data<br/>Database Excel Fields<br/>Filter Graph Information<br/>Interpret PDF Questionnaire<br/>Record Representation Sort<br/>Spreadsheets</p> | <p>Animation, Animator<br/>Background, Character<br/>Decomposition, Design<br/>Digital device, Edit, Evaluate<br/>Flip book, Fluid movement<br/>Frames, Model, Moving<br/>images<br/>Onion skinning, Still images<br/>Stop motion, Storyboard<br/>Thaumatrope, Zoetrope</p> | <p>Big Data, Bluetooth<br/>Corrupted, Data<br/>Energy, GPS Improve, Infrared<br/>Internet of Things<br/>Personal, Privacy QR codes,<br/>Revolution RFID, SIM,<br/>Simulation Smart city, Smart<br/>school, Stop motion Threat,<br/>WiFi Wireless</p> |
|--|---|---|--|---|--|---|--|

## Summer 2

|                      | EYFS | Year 1  | Year 2   | Year 3  | Year 4  | Year 5   | Year 6   |
|----------------------|------|---|--|---|---|--|--|
| <b>Summer 2</b>      |      | <b>Programming: Bee- bot</b>  | <b>Programming 2: Scratch jnr</b>  | <b>Programming: Scratch</b>   | <b>Programing 2:<br/>Computational thinking</b>   | <b>Programming: Music</b>  | <b>Programming: Intro to Python</b>  |
| <b>Key knowledge</b> |      | <p>To understand the basic functions of a Bee-Bot.</p> <p>To know that you can use a camera/tablet to make simple videos.</p> <p>To know that algorithms move a Bee-Bot accurately to a chosen destination.</p>   | <p>To know that coding is writing in a special language so that the computer understands what to do.</p> <p>To understand that the character in ScratchJr is controlled by the programming blocks.</p> <p>To know that you can write a program to create a musical instrument or tell a joke.</p>  | <p>To know that Scratch is a programming language and some of its basic functions</p> <p>To understand how to use loops to improve programming.</p> <p>To understand how decomposition is used in programming.</p> <p>To understand that you can remix and adapt existing code.</p>   | <p>To know that combining computational thinking skills can help you to solve</p> <p>To understand that pattern recognition means identifying patterns to help them work out how the code works.</p> <p>To understand that algorithms can be used for a number of purposes e.g. animation, games design etc</p>   | <p>To know that a soundtrack is music for a film/video and that one way of composing these is on programming software.</p> <p>To understand that using loops can make the process of writing music simpler and more effective.</p> <p>To know how to adapt their music while performing.</p>   | <p>To know that there are text-based programming languages such as Logo and Python.</p> <p>To know that nested loops are loops inside of loops</p> <p>To understand the use of random numbers and remix Python code.</p>   |
| <b>Key skills</b>    |      | <ul style="list-style-type: none"> <li>➤ Following a basic set of instructions.</li> <li>➤ Assembling instructions into a simple algorithm.</li> <li>➤ Programming a floor robot to follow a planned route.</li> <li>➤ Learning to debug instructions when things go wrong.</li> <li>➤ Using programming language to explain how a floor robot works.</li> <li>➤ Learning to debug an algorithm in an unplugged scenario.</li> <li>➤ Taking and editing photographs.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Recognising that buttons cause effects and that technology follows instructions.</li> <li>➤ Explaining what an algorithm is</li> <li>➤ Following an algorithm.</li> <li>➤ Computer science</li> <li>➤ Creating a clear and precise algorithm.</li> <li>➤ Learning that programs execute by following precise instructions.</li> <li>➤ Incorporating loops within algorithms.</li> <li>➤ Using logical thinking to explore software, predicting, testing and explaining what it does.</li> <li>➤ Using an algorithm to write a basic computer program.</li> <li>➤ Using loop blocks when programming to repeat an instruction more than once.</li> <li>➤ Using software (and unplugged means) to create story animations.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Using decomposition to explore the code behind an animation.</li> <li>➤ Using repetition in programs.</li> <li>➤ Using logical reasoning to explain how simple algorithms work.</li> <li>➤ Explaining the purpose of an algorithm.</li> <li>➤ Forming algorithms independently.</li> <li>➤ Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</li> <li>➤ Incorporating loops to make code more efficient.</li> <li>➤ Continuing existing code.</li> <li>➤ Making reasonable suggestions for how to debug their own and others' code.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Using decomposition to solve a problem by finding out what code was used.</li> <li>➤ Using decomposition to understand the purpose of a script of code.</li> <li>➤ Identifying patterns through unplugged activities.</li> <li>➤ Using past experiences to help solve new problems.</li> <li>➤ Computer science</li> <li>➤ Using abstraction to identify the important parts when completing both plugged and unplugged activities.</li> <li>➤ Creating algorithms for a specific purpose.</li> <li>➤ Using abstraction and pattern recognition to modify code.</li> </ul> | <ul style="list-style-type: none"> <li>➤ Predicting how software will work based on previous experience.</li> <li>➤ Iterating and developing their programming as they work.</li> <li>➤ Confidently using loops in their programming.</li> <li>➤ approach to debugging code, justifying what is wrong and how it can be corrected.</li> <li>➤ Writing code to create a desired effect.</li> <li>➤ Using a range of programming commands.</li> <li>➤ Using repetition within a program.</li> <li>➤ Amending code within a live scenario.</li> <li>➤ Using logical thinking to explore software more independently, making predictions based on their previous experience.</li> <li>➤ Information technology</li> <li>➤ Using a software programme (Sonic Pi/Scratch) to create music</li> <li>➤ Identify ways to improve and edit programs, videos, images etc</li> </ul> | <ul style="list-style-type: none"> <li>➤ Decomposing a program into an algorithm.</li> <li>➤ Writing increasingly complex algorithms for a purpose.</li> <li>➤ Debugging quickly and effectively to make a program more efficient.</li> <li>➤ Remixing existing code to explore a problem.</li> <li>➤ Using and adapting nested loops.</li> <li>➤ Programming using the language Python.</li> <li>➤ Changing a program to personalise it.</li> <li>➤ Evaluating code to understand its purpose.</li> <li>➤ Using logical thinking to explore software independently, iterating ideas and testing continuously</li> </ul> |

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| <b>Key vocabulary</b> |  | Algorithm, Artificial, intelligence, Bee-Bot, Clear, Code, Debug, Demonstration, Filming, Inputting, Instructions, Pause, Precise, Predict, Program, Tinker, Video, Video recording | Algorithm, Animation Blocks, Bug, Button, CGI, Computer code Code, Debug, Fluid, Icon, Imitate Instructions, Loop 'On tap', Programming Repeat, ScratchJR Sequence Sound recording | Algorithm, Animation Application, Code, Code block, Coding application, Debug Decompose, Interface Game. Loop, Predict Program, Remixing code Repetition code, Review Scratch, Sprite, Tinker | Abstraction Algorithm Code Computational thinking Decomposition Input Logical reasoning Output Pattern recognition script Sequence Variable | Beat, Bugs. Coding Command Debug, Decompose, Error Instructions, Loop, Melody, Mindmap, Music, Output Performance, Pitch, Plan, Play Predict, Programming, Repeat Rhythm, Scratch, Soundtrack, Spacing, Tempo, Timbre, Tinker, Tutorials, Typing | Algorithm, Code Command, Design Import, Indentation Input, Instructions Loop, Output, Patterns, Random, Remix, Repeat Shape |
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